

Growing WILD

Spring 1994

Utah's Project WILD Newsletter



The Hot Desert --

Utah's Amazing Mojave

*western
banded gecko*

Deserts -- hot landscapes with little water, yet rich in plant and animal life! In North America, there are four deserts -- the Great Basin, Mojave, Sonoran and Chihuahuan. All occur between the Sierra Nevada Mountains on the west and the Rocky Mountains on the east. Two of these deserts, the Great Basin and Mojave occur in Utah. Whereas the Great Basin covers a large portion of Utah west of the Wasatch mountains, the Mojave is found only in the extreme southwest corner of the state.

The Mojave desert is a unique ecosystem where Joshua-trees, gila monsters, dune primroses and desert tortoises all thrive. The Mojave desert is a HOT desert, unlike the Great Basin. Air temperatures in Utah's Mojave sometimes reach 115 degrees Fahrenheit in the summer, and ground temperatures reach a scorching 140 degrees.

The hot Mojave receives nearly all of its precipitation as rainfall in the winter, whereas the Great Basin is considered a cold desert because it receives much of its precipitation in the form of snow and has low average annual temperatures. By definition, deserts receive generally less than 10" of precipitation a year, and they lose great quantities of moisture through evaporation. The Mojave is known as the driest of all the North American deserts. Rainfall throughout the Mojave desert varies greatly. For example, St. George records an average of 7.95" of rain a year, whereas Death Valley has an annual rainfall average of only 1.7".

It's time to dispel the myth that deserts are wastelands, barren of plant and animal life. In reality, the Mojave supports diverse and fascinating plant communities. Many species of plants in the Mojave are endemic to this one area; that is, they are found growing ONLY in the Mojave, occurring in no other ecosystem in the world. One-fourth of all Mojave desert plants are endemic, including the Joshua-tree, Parry saltbush, Mojave sage, woolly bur sage and approximately 200 annuals.

The great diversity of plants may account for the great diversity of animals. For example, in the Mojave you'll find sidewinders and iguanas, roadrunners, bats, bobcats and kangaroo rats, insects, scorpions, spiders and yucca moths. All have important roles in the complex web of desert life.

When you explore the Mojave Desert, you find a unique ecosystem where a fragile balance exists between the plants and animals living there. Learning about the desert, learning how the plants and animals adapt to it, and learning about its beauty help us to understand its value.

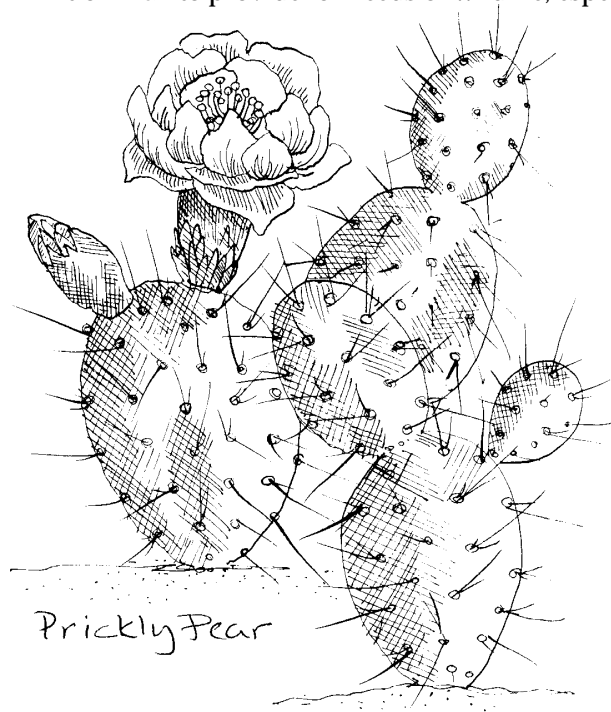
In Desert Notes, Barry Lopez says, "Will you walk along the edge of the desert with me? I would like to show you what lies before us." This issue of "Growing WILD" provides background information and activities about Utah's deserts. Take a chance -- take your students for a walk in the desert!

Resource File

Teaching about the Desert!

Contact the Project WILD office (538-4719) to check out the following materials about deserts in our new Desert Resource File:

- "Cactus Desert," video (10 minutes/elementary), focuses on desert communities with a close look at diurnal and nocturnal animals.
- List of the common plants and animals found in Utah's Mojave and Great Basin deserts.
- "The Lytle Preserve," flyer, introduces you to the Mojave desert and the diversity of species found there. Lytle Preserve is located west of St. George on Old Highway 91. Flyer tells teachers and students how to make arrangements to visit.
- "Discovering Deserts," *NatureScope*, National Wildlife Federation.
- OBIS activities: "Desert Hunt," "Cactus Wheel," "Night Eyes," "Desert Water Keepers," and "Leapin' Lizards."
- "Utah's Amphibians and Reptiles," pamphlet, includes brief descriptions of Utah's 83 species of amphibians and reptiles (free copies available).
- "Utah Reptiles," article by Jim Glenn (reprints available).
- Desert Voices and The Desert Is Theirs by Byrd Baylor (elementary).
- *Natural History*, Vol. 102, No. 8, August 1993. Special issue, "Beating the Heat," presents over fifteen articles on how living organisms survive and even thrive in the heat.
- Great Basin Desert curriculum from Great Basin National Park (see page 8).
- Video describing endangered species in Washington County and development of a Habitat Conservation Plan to provide for needs of wildlife, especially the desert tortoise, and people.



Nature's Call -- "The Amazing Mojave"

"The Amazing Mojave," found in the center of this issue of *Growing WILD*, is written for young people who are studying desert ecosystems. Designed primarily to support core requirements at the fourth and fifth grade levels, the activities may be adapted and extended to meet goals and objectives at other grades. We hope that you are able to incorporate these concepts and activities into your curricula, and we would appreciate receiving some samples of your students' work to display at our Salt Lake office.

If you are interested in receiving a classroom set of this issue of Nature's Call, contact the Project WILD office.

Are You Ready For the New WILD Gecko T-Shirt?!

Project WILD's new T-shirt features the western banded gecko that is found in Utah's Mojave desert. Designed by Jill Rensel, the gecko looks out from a background of Joshua-trees and hot desert. Available in stonewashed blue and green, sizes large and extra large, for \$10. Call the Project WILD office (538-4719) to order!

The Cold Desert -- Utah's Great Basin

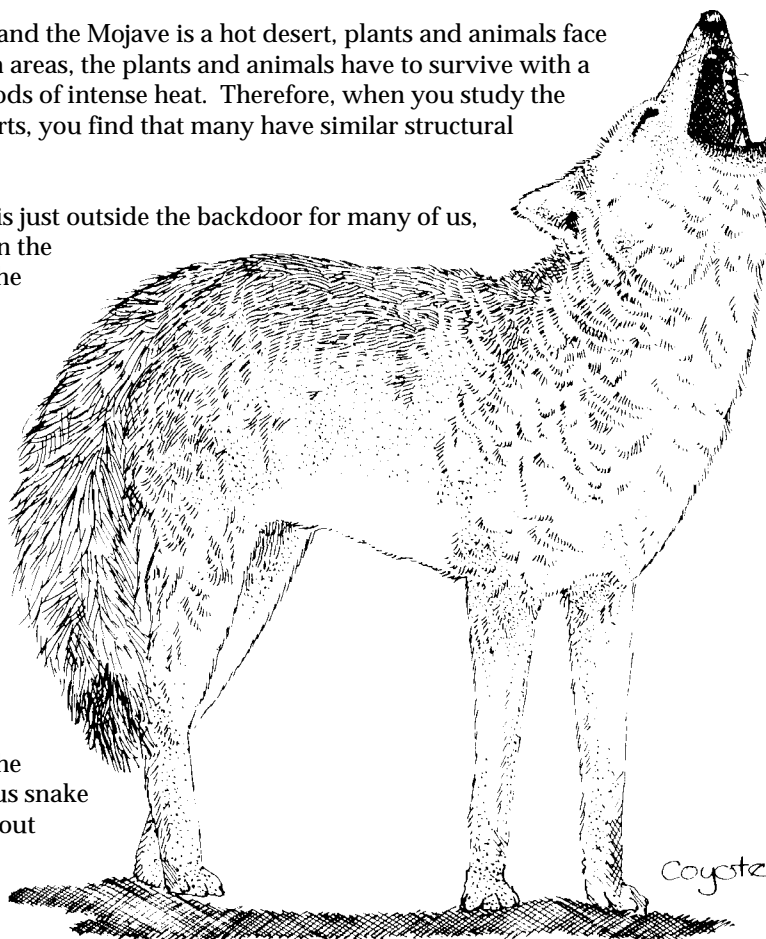
A land of sagebrushes, saltbushes, hot summers and freezing winters, the Great Basin desert covers a wide expanse. In Utah, it extends from the edge of the Mojave desert near St. George north to Idaho and from the Wasatch range west to Nevada. In all, the Great Basin desert occupies almost 160,000 square miles, including the southern half of Idaho, the southeastern corner of Oregon and the northern three-fourths of Nevada. It is the largest desert area in the United States.

The Great Basin desert is considered "cold" because it receives most of its precipitation in the form of snow and because it has low average annual temperatures. It is the northernmost desert in the United States and has base elevations that generally exceed 4000 feet. Mountain peaks encircled by the Great Basin desert often exceed 12,000 feet. On the average, temperatures in the Great Basin are more moderate than those in other deserts. In Wendover, with an elevation of 4237 feet, summers can record high temperatures over 100 degrees but generally average about 80 degrees. Average winter temperatures, on the other hand, fall just below freezing.

Although the Great Basin desert has fewer plant and animal species than the Mojave desert, the species found here are well-adapted to this unique desert ecosystem. Here you don't find the variations in cacti or yucca that you find in the Mojave; and you don't find as many native annual plants or native trees and shrubs along riparian areas or washes. But you do find plants and animals that are specific to slight differences in environmental conditions. For example, the sagebrush communities that cover miles and miles of Great Basin landscape include over ten species of sagebrush, and their distribution corresponds to slight variations in rainfall, temperature and soil. Where soils become salty, sagebrush gives way to salt-tolerant species, like saltbushes.

Although the Great Basin is a cold desert and the Mojave is a hot desert, plants and animals face similar environmental challenges. In both areas, the plants and animals have to survive with a limited supply of water and through periods of intense heat. Therefore, when you study the plants and animals of these different deserts, you find that many have similar structural and behavioral adaptations.

The Great Basin desert ecosystem, which is just outside the backdoor for many of us, invites us to investigate it. For example, in the spring, find the sagegrouse and listen to the males "drum." Explore the relationship between sagegrouse and sagebrush. Look for the mounds of harvester ants, which sometimes cover up to 15% of some desert areas in northern Utah. And look for spiders, which in some desert-shrub communities may include 20 to 40 species. Listen for the Great Basin spadefoot toad, which emerges from its burrow when vibrations of raindrops alert it to the availability of water; and during the day watch for the western whiptail lizard. Two other reptiles often seen are the Great Basin gopher snake, a non-venomous snake sometimes called the "blow snake," and the Great Basin rattlesnake, the only venomous snake in the area. Finally, always be on the lookout for badgers, antelope, kangaroo rats, kit foxes, bobcats, black-tailed jackrabbits and coyotes.



The Great Basin desert is full of surprises. Take the time to look at it closely; you and your students will be well-rewarded!

The Joshua-tree grows only in the Mojave desert and is the tallest yucca plant that you will find there! Sometimes growing as tall as 30 feet, the Joshua-tree is a major center of animal activity in the Mojave. In addition to the animals that benefit from the Joshua-tree, there is one animal that the Joshua-tree can't live without! Read below to learn more about these interesting relationships.

First read the descriptions of how some animals use the Joshua-tree. Then draw a line from each description to the animal's silhouette. After you have checked your answers with those on the next page, draw the animals where you would find them on the tree. Inside the illustration of the flower, write the name of the animal that Joshua-trees depend on for their survival.

These animals live in the Mojave desert and use the Joshua-tree in many different ways. **Find the animal that:**

1. drills a hole in the trunk for its nest!
2. builds its midden (or shelter) using fresh leaves that it clips from the branches!
3. lives under dead leaves on the trunk or under branches that have fallen onto the ground! Being only 3 inches long, it can hide easily and still find lots of termites, ants and beetles on the tree to eat!
4. weaves a nest from the leaf fibers and attaches it to hang down from a high branch!
5. hides in the leaves and catches its prey (like termites) by stinging them!
6. uses the branches for a perch during the day and sometimes builds a large nest in the upper branches!
7. uses the branches for a perch at night!
8. feeds on the night lizards that live in the tree or under dead branches at the base of the tree!
9. pollinates the flowers of the tree! In fact, this is the **ONLY** insect that can pollinate the flowers of the Joshua-tree, and it's **ONLY** in the flowers of the Joshua-tree that this insect lays its eggs. When the eggs hatch, the larvae feed on some of the seeds of the tree, while some seeds naturally are spread across the desert to generate new plants. Because both species benefit from this relationship, this is called "mutualism."
10. impales prey (like lizards) on needle-like leaves. This songbird has a hook-tipped bill.



ladder-backed
woodpecker



barn owl



desert
woodrat



scorpion



red-tailed
hawk



loggerhead shrike



yucca moth



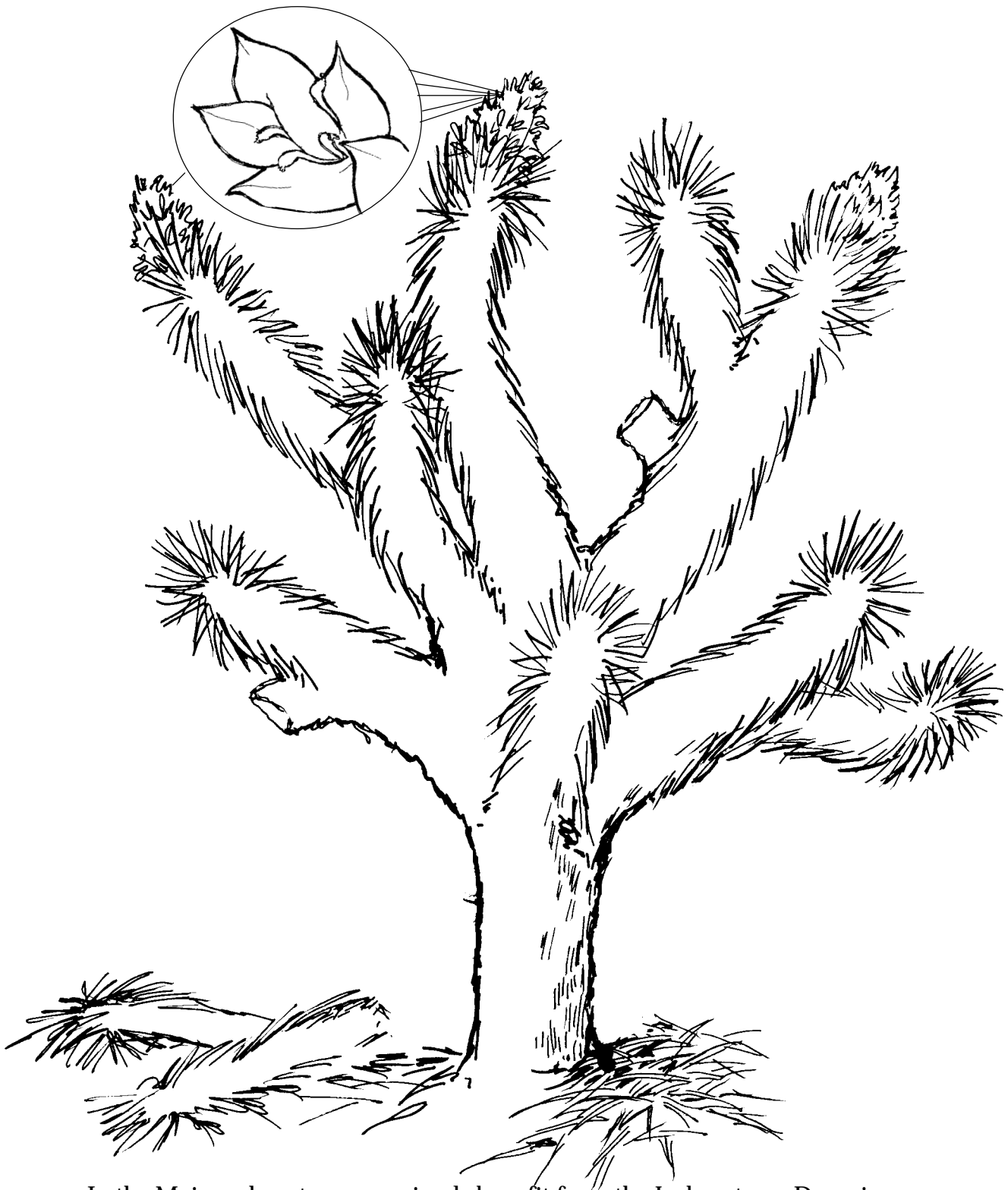
Scott's oriole



night snake



night lizard



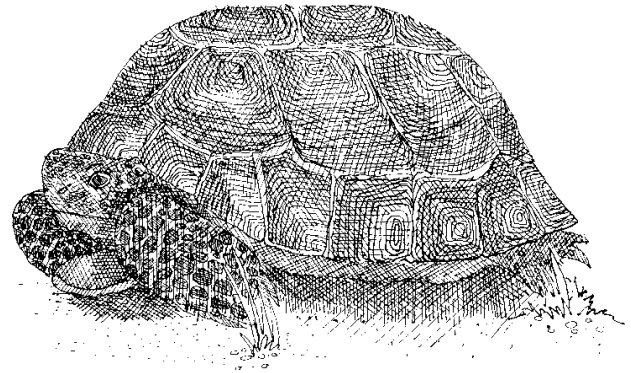
In the Mojave desert, many animals benefit from the Joshua-tree. Draw in the animals that you have learned about. In the flower, write the name of the insect that pollinates the Joshua-tree and lays its eggs deep in the flower.

Objectives: Students will be able to:

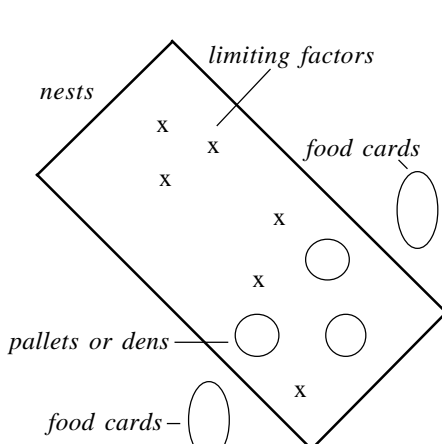
- describe the life cycle of the desert tortoise.
- identify specific limiting factors to the tortoise population.
- make inferences about those limiting factors and desert tortoise populations.
- recommend actions which will minimize the impact of limiting factors which can contribute to the possible extinction of the desert tortoise.

Method: Students become desert tortoises and limiting factors in a simulation activity.

Background: Call the Project WILD office (801-538-4719) to receive a free copy of the desert tortoise "Wildlife Photo Series" card with photograph and natural history information.



desert tortoise



Materials (for a group of 30 students)

- rope or string to identify dens, pallets and nests
- small plastic or paper bag for each student in the class
- food cards (150 small pieces of green paper to represent plants)
- Identity signs for each predator or limiting factor (clothespins to attach signs to clothing)
- Beans

Procedure:

1. Set up the activity area as illustrated.
Give each student in the class a paper or plastic bag.
2. Divide the class into two groups (2/3 in group one; 1/3 in group two).

Group 1 Tortoises

Have each student in this group count out 12 beans and place the beans in each bag. The beans represent a population of tortoises that can hatch in a single nest. (*In the general population, tortoises may lay up to 12 eggs in a single nest, but in Utah's Mojave desert tortoises average six eggs per nest.*)

Group 2 Predators/Limiting factors

Give out identity signs to students in this group. Possibilities include: cows, ravens, coyotes, off-road vehicles, upper respiratory disease, illegal killing or capture by humans, loss of habitat.

3. Walk the class through the activity, explaining the rules as follows:
 - A. Tortoises must hatch from their nests and cross the desert to feed on plants.
 - B. Each tortoise must collect 10 food cards, alternating from one side of the field to the other when collecting. Each food card represents two years in the desert until, in this simulation, they reach maturity at age 20 and return to their nests to reproduce. *In reality, tortoises reach maturity between 15 and 20 years of age, depending on length of seasons and food availability.*

- C. The dens and pallets in the open desert area represent places where desert tortoises are safe from limiting factors.
- D. While tortoises are collecting food cards, they may be tagged with both hands by limiting factors. When a limiting factor tags a tortoise, that tortoise must give two beans to the limiting factor. Limiting factors must obey the following rules:
- They cannot tag the same tortoise twice in a row.
 - They cannot tag tortoises that are giving beans to another limiting factor, and they must stay four steps away from any tortoise that is giving beans to another limiting factor.
- E. Any tortoise that loses all 12 beans is dead. At the end of the activity, any tortoise that has not picked up at least 10 food cards is dead, not having survived to maturity. When a tortoise dies, it stands with other dead tortoises on the side.
- F. The activity ends when the teacher recognizes that some tortoises have returned to their nests and that some tortoises have been lost to predation or other limiting factors.
4. Review rules and conduct the activity.
5. Close the activity with a discussion of the results.
- How many tortoises survived?
 - What was the greatest problem for the desert tortoises?
 - What is the difference between limiting factors such as coyotes, ravens or foxes and limiting factors such as road building, subdivision development or illegal capture of tortoises?
 - Discuss the length of time it takes tortoises to reach maturity in order to reproduce. How does that affect the survival of the population?
 - Identify specific actions which could help desert tortoise populations to survive.

Extensions

- Change the ratio of tortoises to limiting factors (1/3 in group one; 2/3 in group two). Discuss.
- Visit a desert and learn to identify the plants that desert tortoises commonly feed on.
- Set up a desert tortoise information center in your school.
- Discuss the Endangered Species Act and how it protects the desert tortoise.

Evaluation

- Describe or illustrate the life cycle of a desert tortoise.
- Name at least four limiting factors that prevent tortoises from reaching breeding age.
- Write a law that would help protect desert tortoises.
What would the law include? Who would enforce it?

•If you'd like more information about desert tortoises in Utah, call the Project WILD office (538-4719) to check out the video which describes the Habitat Conservation Plan developed for Washington County. The video explains the fragile desert ecosystem, the endangered species found there and the increasing human activity in the area. We also have available for check-out several activities about tortoises that have been developed by Utah teachers.

Tortoises are opportunistic feeders in the desert environment. Some of the common plants they are known to eat include native species like the purple-rooted forget-me-not, dune primrose, Indian rice grass, plantain and yellow peppergrass (which despite its name is actually a wildflower!), as well as exotic species like storksbill, Mediterranean grass and bromes.

dune primrose



Learn About The Great Basin --

New Curriculum Available from Great Basin Park

Great Basin National Park, near Baker, Nevada, has developed a comprehensive curriculum for teachers in grades K-12 that teaches about the Great Basin desert and the area surrounding Great Basin National Park. Although the curriculum is still in draft form, the Park Service is eager to have teachers use it and send them constructive feedback.

The curriculum has sections that focus on geography, geology, cave exploration and bats, desert adaptations of plants and animals, and human history. Each section includes extensive background information, activities (see next page for a sample activity), glossary and a list of resources. Many of the activities have been designed to support science topics, but they have been correlated to subjects across the curriculum. In order to encourage park field trips, the curriculum includes a listing of recommended activities which can be done before, during and after the field trip.

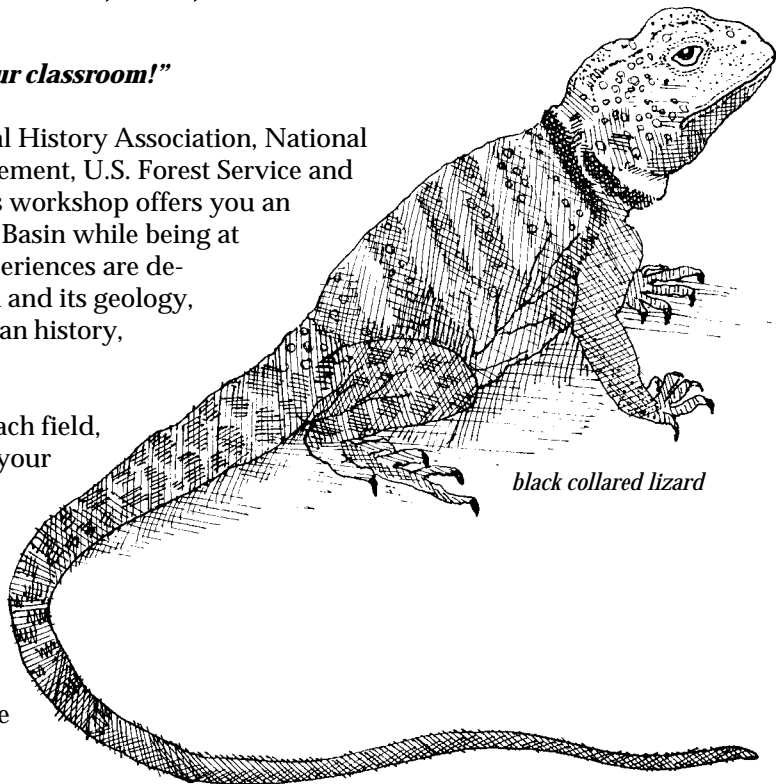
•If you're interested in obtaining a copy of this curriculum, you may contact the Project WILD office (538-4719). Terry Baldino, Interpretive Specialist for Great Basin National Park, would like to request that teachers who use the curriculum give him some feedback on the sections or activities that they use. He explains that this would be very helpful to them in completing the final draft. You may request the entire 120-page curriculum, or you may request just the section you're interested in teaching. *(The section on desert adaptations includes background information and six K-12 activities, including activities on evaporation, how plants reduce water loss and general plant and animal adaptations.)*

Free Great Basin Teacher's Workshop *June 22, 23, & 24*

"Let an entire ecosystem serve as your classroom!"

Sponsored by the Great Basin Natural History Association, National Park Service, Bureau of Land Management, U.S. Forest Service and Nevada State Museum, this teacher's workshop offers you an opportunity to learn about the Great Basin while being at Great Basin National Park. Field experiences are designed to teach about the Great Basin and its geology, animals, plants, archeology and human history, ranching and mining.

You will be taught by specialists in each field, participate in activities designed for your classroom, share ideas, use a cross-curricula approach to learning and receive free teaching materials. For more information or to register, contact Trish Hadsall, Great Basin Natural History Association, Great Basin National Park, Baker, Nevada 89311 (702-234-7270). Participants are responsible for their own lodging.



black collared lizard

(The following activity is from the Great Basin curriculum guide and is reprinted with permission from Great Basin National Park. To obtain a copy of this curriculum guide, see page 8 of "Growing WILD.")

Hot Shots! *(an activity about soil temperature)*

Grade Level: 2-8

Subjects Used: Science

Duration: 1 hour (with about a 1 hour wait)

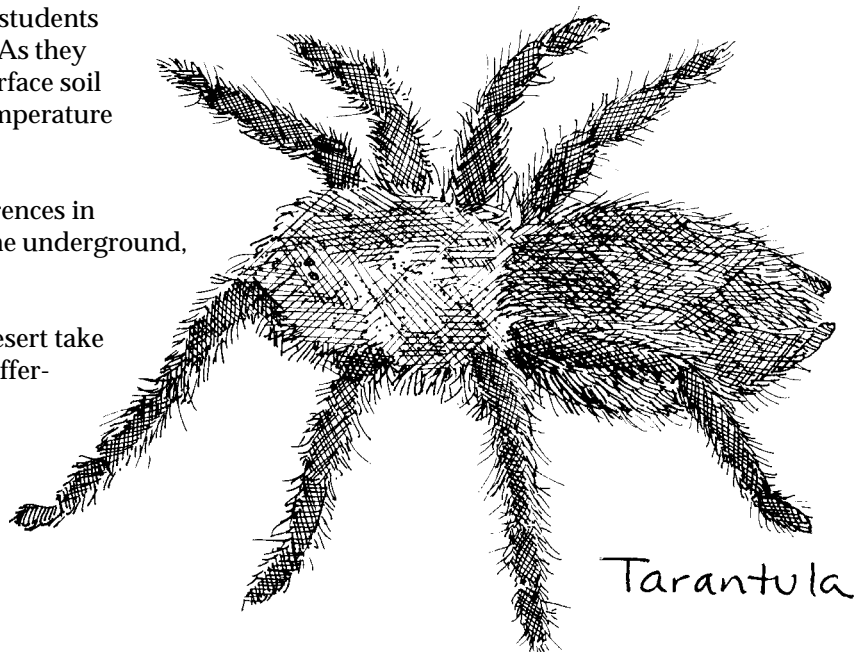
Key Vocabulary: soil, desert, heat, temperature, adaptation

Objective: Students will see the advantage desert animals gain by avoiding the ground's surface during the hot desert daytime

Materials: 3 thermometers, sand box or gravel area or yard that can be dug up

On the desert's surface, the temperature can soar to 190 degrees F, but just a few feet underground, it may be 60 degrees cooler. Many animals take advantage of this temperature difference to avoid overheating. To beat the heat, they crawl into burrows and dens beneath the hot surface. If they do not go beneath the surface, they find some shady area to avoid the direct rays of the sun. The following exercise will help demonstrate the temperature differences in soil.

1. Sometime in the early afternoon of a sunny day, bury a thermometer a few inches beneath the surface of the ground or in a sandbox.
2. Lay another thermometer right on the ground. (You can also measure air temperature by taking a temperature reading approximately 4 feet above the ground.)
3. After about an hour, have the students dig up the buried thermometer. As they dig, make sure they touch the surface soil and the deeper soil to feel the temperature difference.
4. Have them compare the differences in temperature readings between the underground, surface, and air thermometers.
5. Discuss how animals in the desert take advantage of this temperature difference.

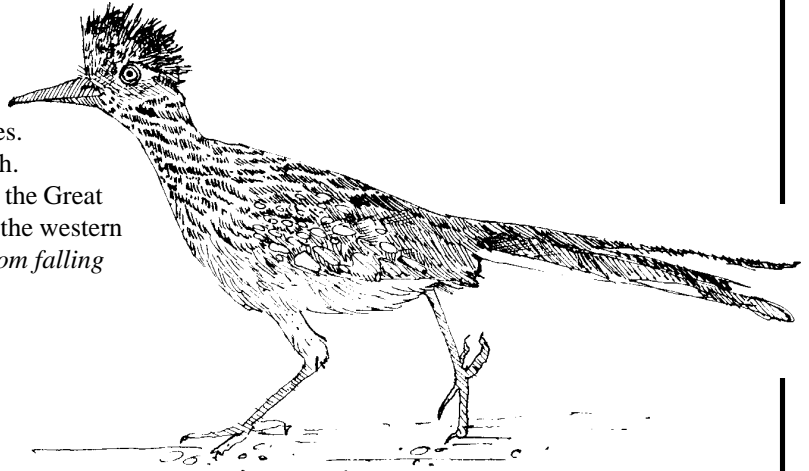


Why are there deserts in Utah?

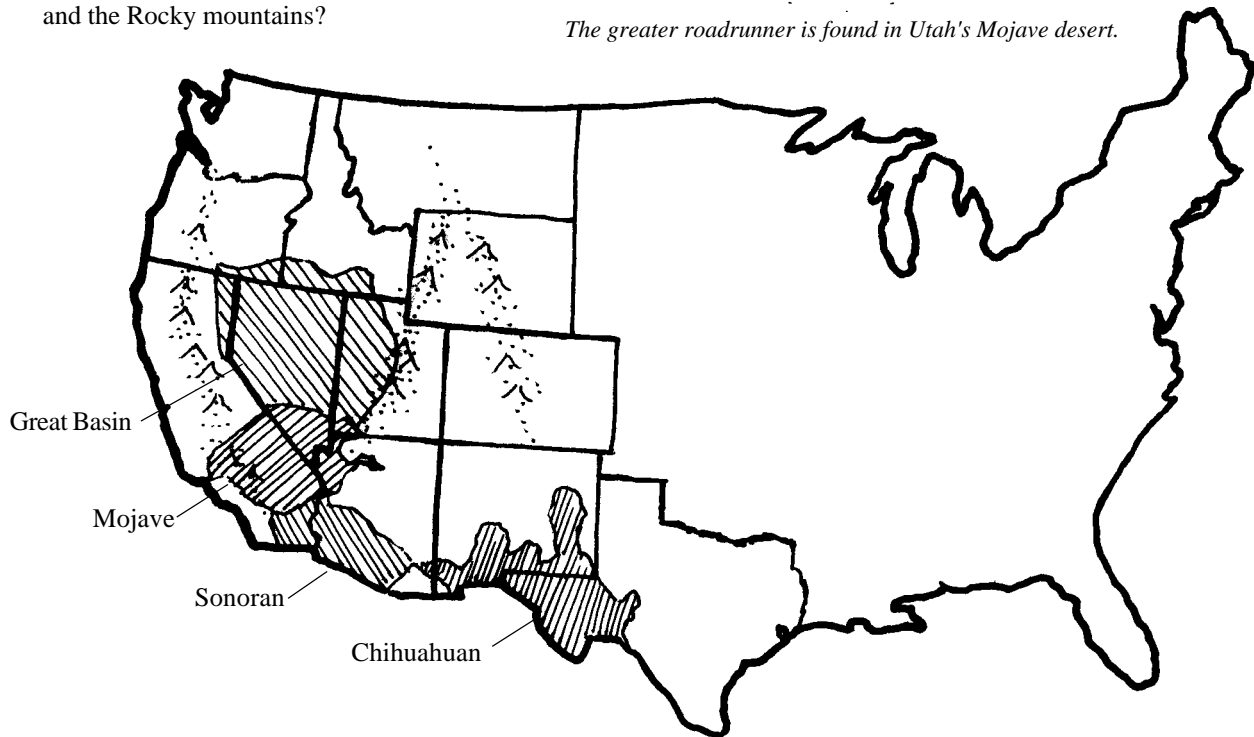
Utah is the second driest state in the United States. Only Arizona receives less precipitation than Utah. Much of Utah has a desert climate and lies within the Great Basin or the Mojave deserts. In general, most of the western United States is very dry. *What keeps the rain from falling on Utah?*

Look at the map of the United States.

- Where are the deserts located?
- Why do you think they are found between the Sierra Nevada mountains of California and the Rocky mountains?



The greater roadrunner is found in Utah's Mojave desert.

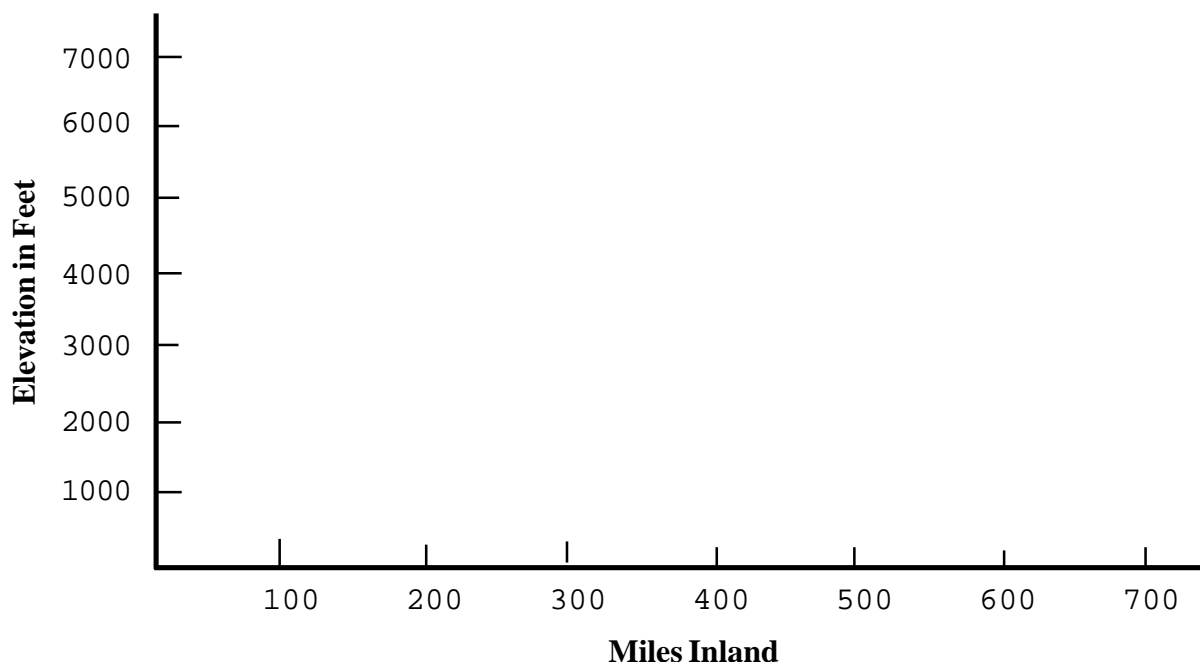


•To check your answer, graph the elevations of the following locations on the next page. The locations lie in a straight line from the Pacific Ocean to Salt Lake City.

	Location	Elevation	Miles Inland	Yearly Precipitation Total
Point A	Fort Bragg, CA	170 ft.	1 mile	38.97 inches
Point B	Canyon Dam, CA	4,500 ft.	150 miles	38.42 inches
Point C	Central Sierras, CA	6,900 ft.	180 miles	71.4 inches
Point D	Vinton, CA	4,900 ft.	200 miles	13.28 inches
Point E	Wendover, UT	4,237 ft.	543 miles	4.84 inches
Point F	Salt Lake City, UT	4,222 ft.	656 miles	16.13 inches

•Draw a line connecting each point.

•Write the name of each location and its yearly precipitation total (which includes both rain and snow) by each point.



•Let's interpret the data!

Which location received the greatest amount of rainfall for the year?

Which location received the least?

Does precipitation increase or decrease with elevation?

Compare the precipitation totals from two locations with similar elevations by looking at the data from Wendover and Canyon Dam. What is the difference between the two locations? Why does the greatest amount of rain fall on the western side of the Sierras?

•Take a look at the weather patterns for the answer!

Weather patterns move across the United States from west to east. A storm that comes in from the Pacific will first strike California and then move eastward across the U.S. Before the storm can reach Utah, it must first go up and over the Sierra Nevada mountains.

•What happens when warm, moist ocean air is forced to rise? It cools off.

•What happens to warm, moist air when it is cooled? It falls in the form of either snow or rain.

To illustrate this, blow your warm, moist breath on a cold window. What happens? Water molecules in your breath cool off and get closer together. So close that the water vapor changes from a gas to a liquid. The moisture in your breath then condenses on the window as a liquid. The same thing happens when a Pacific storm is forced to rise up over the Sierra Nevada mountains. That is why Canyon Dam gets about 40 inches of rain each year and Wendover only gets about 5 inches.

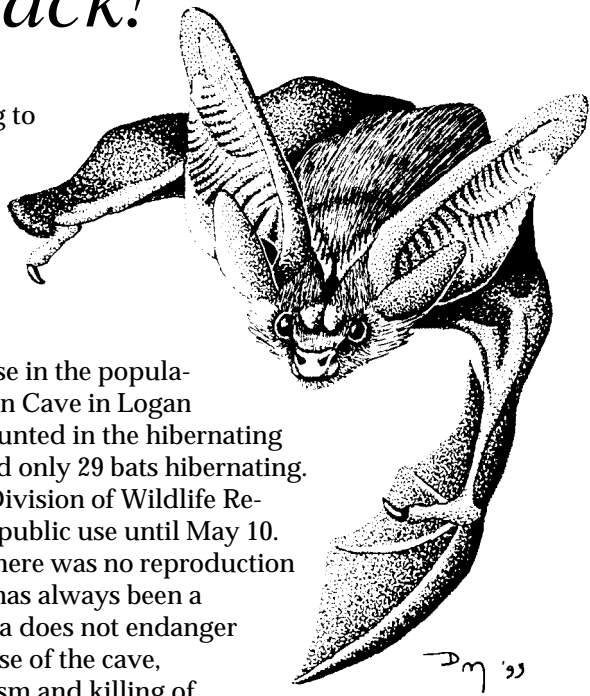
Once the storms drop their moisture in the Sierra Nevadas and other ranges along the Pacific coast, there is very little moisture left to fall east of the mountains. **The dry areas of the United States lie east of the Sierra Nevadas in this huge "shadow" where there is little rainfall. This condition is known as the "rain shadow effect," and that's why there are deserts in Utah!**

Action

Bats Are Back!

Utah's bats, a total of eighteen species, begin returning to Utah's night skies in early May. Many of these bats spent the winter hibernating, while others migrated south to find food. Hibernation is a particularly sensitive time for bats, because any disturbance causes them to use fat reserves that they need if they are to survive until food is available in the spring.

A recent study in Utah has shown an alarming decrease in the population of Townsend's big-eared bats, specifically at Logan Cave in Logan Canyon. In past surveys, as many as 150 bats were counted in the hibernating colony in the cave, whereas this year researchers found only 29 bats hibernating. This 85% reduction in the population has caused the Division of Wildlife Resources and the Forest Service to close Logan Cave to public use until May 10. In addition to the reduction in hibernating numbers, there was no reproduction this past spring in the maternity colony. Logan Cave has always been a popular area, and it appears that proper use of the area does not endanger the bats living there. However, it is thought that misuse of the cave, including disturbance of the hibernating bats, vandalism and killing of the bats, has caused the decline in the population.



"Responsible actions taken by young people may prevent future situations like the one we're seeing at Logan Cave."

State and federal agencies recognize the Townsend's big-eared bat as a sensitive species and are now developing a long term management plan for its recovery. According to Pat White, wildlife biologist, "Students who study bats and learn to appreciate them can have significant long term positive effects on bats and their survival. Responsible actions taken by young people may prevent future situations like the one we're seeing at Logan Cave."

Since bats are so popular with kids, teachers can use this interest in bats to study issues like the one at Logan Cave. Some students might even be interested in simulating the management planning process. Pat says a management plan must address the following issues: How many bats are necessary to maintain a healthy, successful population? Where can the bats live; are there alternatives to the cave? How do you manage for human activities in the same areas needed for the hibernation and reproduction colonies? If you involve your students in this planning process, we would be interested in seeing the results!

•If you're teaching about bats this spring, be sure to call and reserve the *Bats of the World Resource File* and bat videos for grades K-12 (538-4719).

•Also available is a role-playing activity "Who's Cave Is It?" for grades 7-12 from Great Basin National Park. It teaches importance of habitat for bats and introduces a process to resolve situations where human uses and wildlife needs conflict.

"Bat Protection Project"

The team is called B.P.P. -- and the goal is to protect bats. In Ogden, Tommy Garner of Gramercy Elementary heads up a group of students who educate people in the neighborhood about bats -- and why they're good to have around! They think their efforts are paying off and hope that this spring they'll see even more bats nearby. Project WILD congratulates Tommy on his efforts to protect bats. One person can make a big difference! Look for Tommy's letter about his project in the December 1993 issue of *Ranger Rick*!

Learn About Wetlands In Utah --

Bugs, Birds and Bulrushes!

May is National Wetlands Month, and Utah has organized several events to celebrate the diversity of wetlands and increase awareness about this vital and productive ecosystem.

For Fourth Grade Students:

During the week of May 2-6, fourth grade classes can arrange to visit wetland sites where teachers and naturalists will teach about wetlands using hands-on activities and experiences. Field trip sites include the Ogden Nature Center and the Virgin River. Interested teachers should call Patricia Lock-Dawson, Wetlands Specialist, at the Division of Wildlife Resources in Salt Lake (538-4864) to make reservations.

A separate event, Wetlands Day, is scheduled for April 30 at seven different locations throughout the state. The general public is invited to visit these wetlands to learn about them and explore them. Naturalists will be at each site to teach about wetland ecosystems, including the plants and animals found in wetlands. They will also have spotting scopes available for visitors to view the migratory birds that rely on Utah's wetlands for survival.

The Wetlands Day sites, including some areas that are not normally open to public use, are:

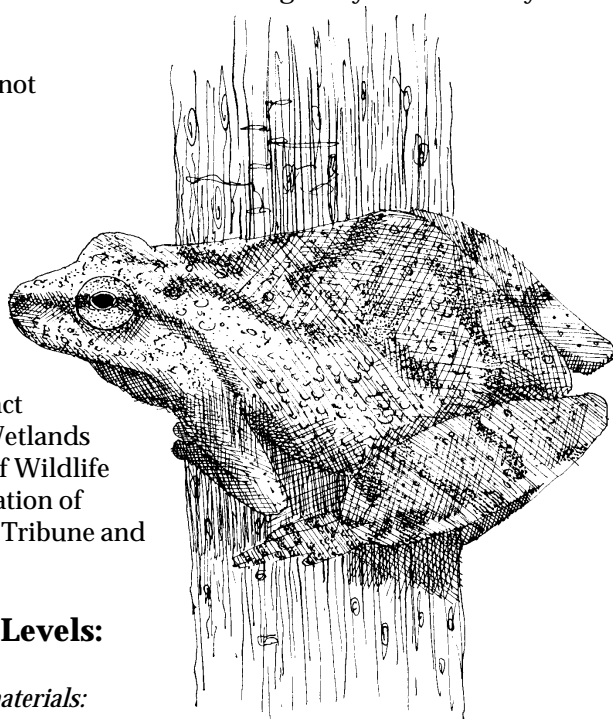
- Ogden Bay (Ogden)
- Farmington Bay (near Salt Lake City)
- Goshen Bay (Provo)
- Cutler Reservoir (Logan)
- Ouray National Wildlife Refuge (Vernal)
- Matheson Preserve (Moab)
- Virgin River (St. George)

For directions, maps and additional information, contact the Utah Division of Wildlife Resources at 538-4700. Wetlands Month activities are being sponsored by the Division of Wildlife Resources, U.S. Fish and Wildlife Service, Utah Association of Conservation Districts, Nature Conservancy, Salt Lake Tribune and National Audubon Society.

Teaching Materials Available For All Grade Levels:

Call the Project WILD office (538-4719) for the following materials:

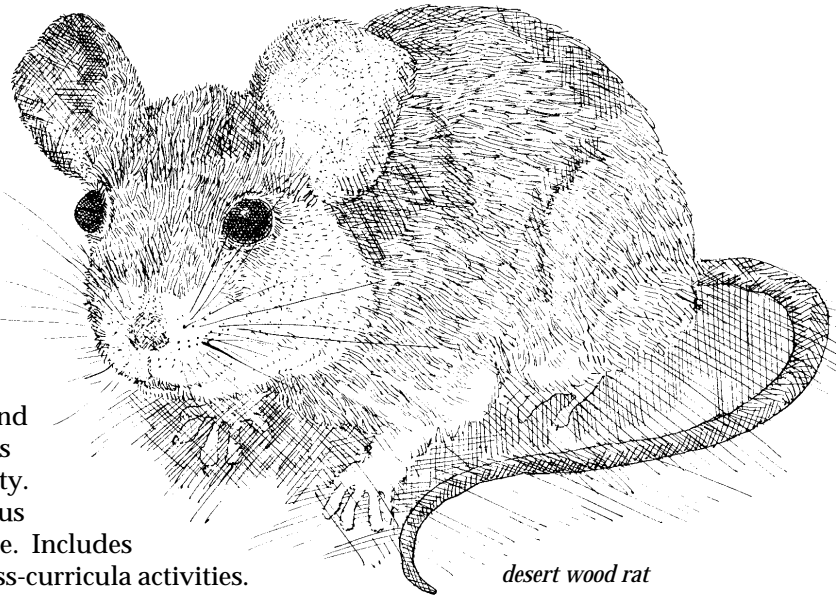
- Free Wetlands poster -- "Fragile Treasures" with colorful habitat and great blue heron
- "Fabulous Wetlands" (7 minutes) is a unique, creative video guaranteed to grab the attention of your students and teach them the basics of wetlands and the need to conserve them. Produced by Washington State Department of Ecology for upper elementary through high school levels.
- Wetlands Resource File
- Booklet entitled "Wetlands of Utah." *This booklet, prepared by Utah State University, U.S. Fish & Wildlife Service, Environmental Protection Agency and the Utah Division of Wildlife Resources, includes descriptions of different types of wetlands (including plants and animals common to each type), where they are found in Utah and how wetland ecosystems function.*
- Wetlands Information Packets have been prepared for teachers of all grades and may be obtained by calling Patricia Lock-Dawson (538-4864).



Resources

*Check these out
from Project WILD
-- 538-4719!*

- “The Wild Wild World of Old-Growth Forests” is a teachers’ guide with activities focusing on old-growth forests. Targeted for students at the upper elementary and middle school levels, this guide was developed by The Wilderness Society. Information gathered reflects various perspectives of the old-growth issue. Includes good background material and cross-curricula activities.



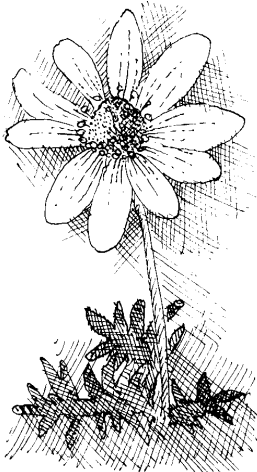
desert wood rat

- For Migratory Bird Week (May 9-14) and Migratory Bird Day (May 14), check out a packet of information and activities. Also call for a list of sites throughout Utah where you can observe neotropical birds.

Free Posters -- Contact the Project WILD office at 538-4719!

- From Ducks Unlimited Inc., we have a colorful “Know Your Waterfowl” poster available for school libraries. If you’re a Project WILD teacher, please request one to put on display or to use as a teaching poster in your library. Includes detailed drawings of over 30 waterfowl species with both hens and drakes colorfully illustrated and shows differences of adult and juvenile swans.

- From the Earth and Sky Radio Series, we have a poster that teaches students how they can make their own science radio shows. Includes step-by-step instructions and sample scripts from the radio series. Encourages students to participate in National Science & Technology Week, April 24-30, and offers a Young Producers Contest for interested students (deadline May 31).



desert anemone

Scholarships Available

Utah Nature Study Society has scholarships available for nature-related educational activities. Designed to promote environmental education, Utah Nature Study has offered scholarships for activities such as junior science academies, natural history courses or the National Wildlife Federation Conservation Summit. All scholarships range from \$5 to \$100. Recipients will need to share information about their completed project with Society members. For more information about how to apply, contact Bruce Wasden at 969-2535.

National Wildlife Week -- Pollution Solutions

Contact your district office for copies of the educator's guide and poster for National Wildlife Week, April 17-23. This year's theme is "Pollution Solutions: Let's Clean Up Our Act!" Activities focus on trash and toxins, air and water pollution, and action projects. Designed for grades K-8.

Summer Studies

Coming Down To Earth

Basin and Range Seminar -- Great Salt Lake Audubon

Study Utah's basin and range ecology June 4-5 at Clover Springs on Johnson Pass, between Rush Valley and Skull Valley. Stay at the Clover Campground and meet with specialists to learn about basin and range ecosystems. Call Jeanne Le Ber at 532-7384 in the evenings for more information. Fee is \$20.

Conservation Summit - National Wildlife Federation

Conference at Southern Utah University offers a week of natural history education and training sessions for teachers and families, August 6-12. Call 1-800-245-5484.

The Yellowstone Institute

Learn about birds of prey, bears, butterflies and wildflowers or sign up to study drawing and storytelling. For more information about these and other classes offered, contact Yellowstone Institute, P.O. Box 117, Yellowstone Park, WY 82190 (307-344-2294). Several classes are available for credit.

NatureQuest -- National Wildlife Federation

Receive three days of training in a variety of conservation education programs. Workshops are designed for teachers, camp directors, naturalists, youth leaders and other outdoor educators. Workshops are scheduled for April (in Kentucky and Virginia) and May (in Wisconsin). Call 1-800-245-5484.

Project Adventure Workshops -- Project Adventure Inc.

Explore uses of physical education and recreation to enhance school, camp, college and youth agency programs. Workshops offered in many locations across the country. Contact Project Adventure Inc., P.O. Box 14171, Portland, OR 97214 (503-239-0169).

Ecology Camps and Workshops -- National Audubon Society

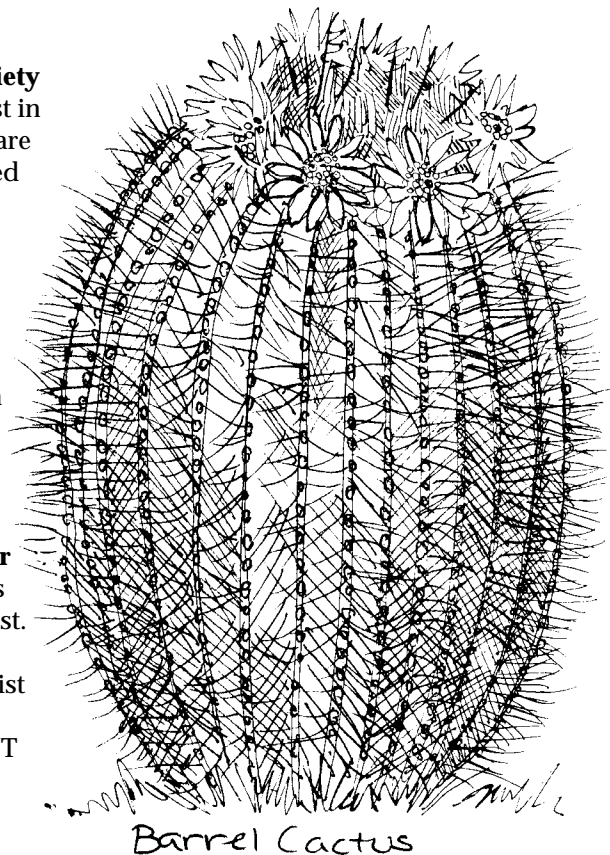
Study mountain field ecology at Audubon Camp in the West in the Wind River Mountains, Wyoming. Week-long sessions are offered throughout the summer (\$695). Another class offered takes a close look at endangered species within the Greater Yellowstone Ecosystem, June 11-18, in Jackson Hole, Wyoming (\$995). Contact National Audubon Society, 613 Riversville Road, Greenwich, CT 06831 (203-869-2017).

Environmental Education Workshops

Variety of workshops offered throughout the Intermountain Region on outdoor education topics, facilitating skills, questioning strategies. For a schedule, call Utah Society for Environmental Education (328-1549).

Outdoor Classes for Young People -- Ogden Nature Center

Ogden Nature Center offers week-long outdoor experiences for students, ages 4 through 12, during June, July and August. Young people, ages 12 through 18, may enroll in the Junior Naturalist Program to study the ecology of the area and assist with classes and programs while learning leadership skills. Contact Ogden Nature Center, 966 W. 12th Street, Ogden, UT 84404 (621-7595).



Barrel Cactus

project WILD

**Utah Division of Wildlife Resources
1594 W. North Temple, Ste. 2110
Salt Lake City, Utah 84116**



Growing WILD and *Nature's Call*, Utah's Project WILD newsletters, are written by Brenda Schussman and Bob Ellis. Bat illustration is by Doug Moore. All other original illustrations are by Jill Rensel.



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